

ABSTRACT OF THE DISCLOSURE

Embodiments of the present invention include a fiber optic seismic sensing system for permanent downhole installation. In one aspect, the present invention includes a multi-station, multi-component system for conducting seismic reservoir imaging and monitoring in a well. Permanent seismic surveys may be conducted with embodiments of the present invention, including time-lapse (4D) vertical seismic profiling (VSP) and extended micro-seismic monitoring. Embodiments of the present invention provide the ability to map fluid contacts in the reservoir using 4D VSP and to correlate micro-seismic events to gas injection and production activity.